Flanged Tritium Waste Container (FTWC) Project Overview

November 5, 2020

What is a FTWC?

- Flanged Tritium Waste Container (FTWC)
  - 51 gallon certified, stainless steel pressure vessel (300 psi)
  - Flanged opening secured with a gasket and 16 bolts
  - Designed for long term storage of tritium contaminated waste items
    - Very robust containers.
    - Four to five AL-M1s holding tritium are placed inside the FTWC (smaller containers inside a larger container). The tritium remains in AL-M1s.

FTWC

AL-M1

Why This Project is Important

- There are four FTWCs at TA-54 Area G pending permanent offsite disposal. Preparing these containers for shipment is part of the larger effort to reduce waste and risk at Area G.
  - Supports Site Treatment Plan, Consent Order, and Area G Closure commitments
- For offsite disposal, containers must meet Department of Transportation (DOT) regulations for shipment, and must be in a safe, compliant configuration for transportation.
  - Any gas pressure in the larger container must be relieved prior to movement
- Only the gas in the larger container (headspace) will be vented, a very small fraction of the overall container contents – this is **not a bulk material release.**
- **This project will meet all regulatory requirements for waste management, air quality, transportation, environmental compliance, and worker and public safety.**
  - Will comply with all Department of Transportation (DOT), DOE Radiological Safety, Resource Conservation and Recovery Act (RCRA), New Mexico Environment Department (NMED), Environmental Protection Agency (EPA), and offsite disposal location requirements prior to shipment

Why This Approach?

- Numerous alternatives were considered, in consultation with regulators, and the selected path forward was deemed to be the safest for the workers, the public, and the environment.
  - Movement (or other nearby activities that might damage the container) without verifying and mitigating internal pressure poses the risk of an unplanned, unmeasured release.
  - Leave-in-place does not make progress toward site risk reduction priorities.
  - The venting and capture systems are proven and specifically engineered for this application to minimize release and protect workers, the public, and the environment.
  - Only the activities necessary for safe handling are being performed at Area G, and all activities related to repackaging and offsite shipment will be performed in LANL's tritium facility.

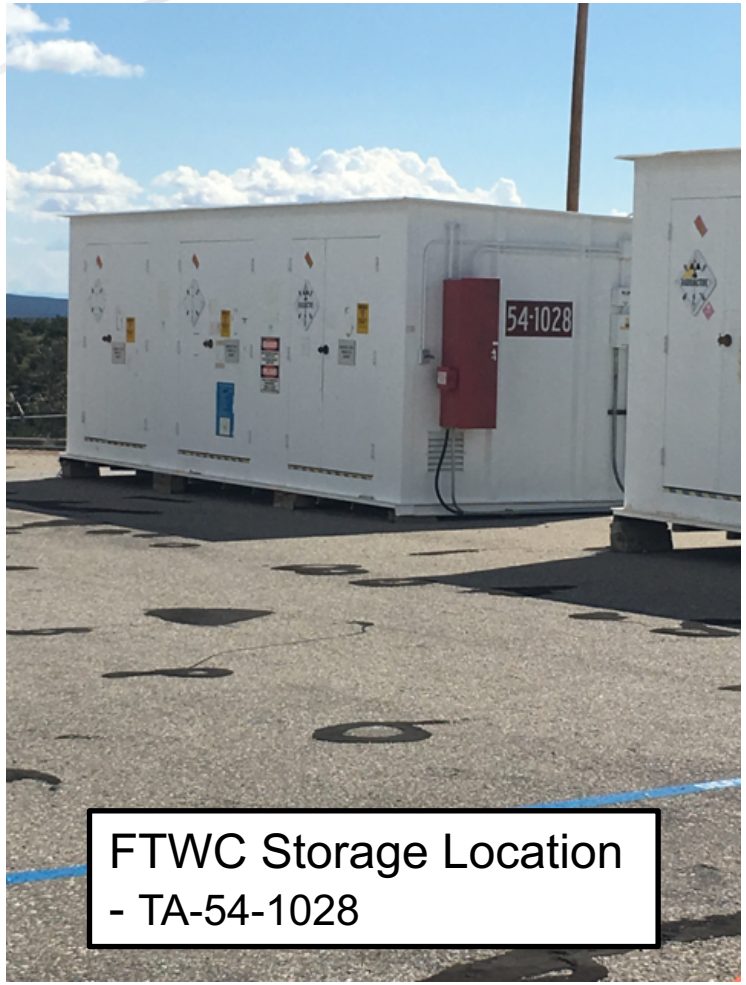
Area G FTWCs - Map

UNCLASSIFIED

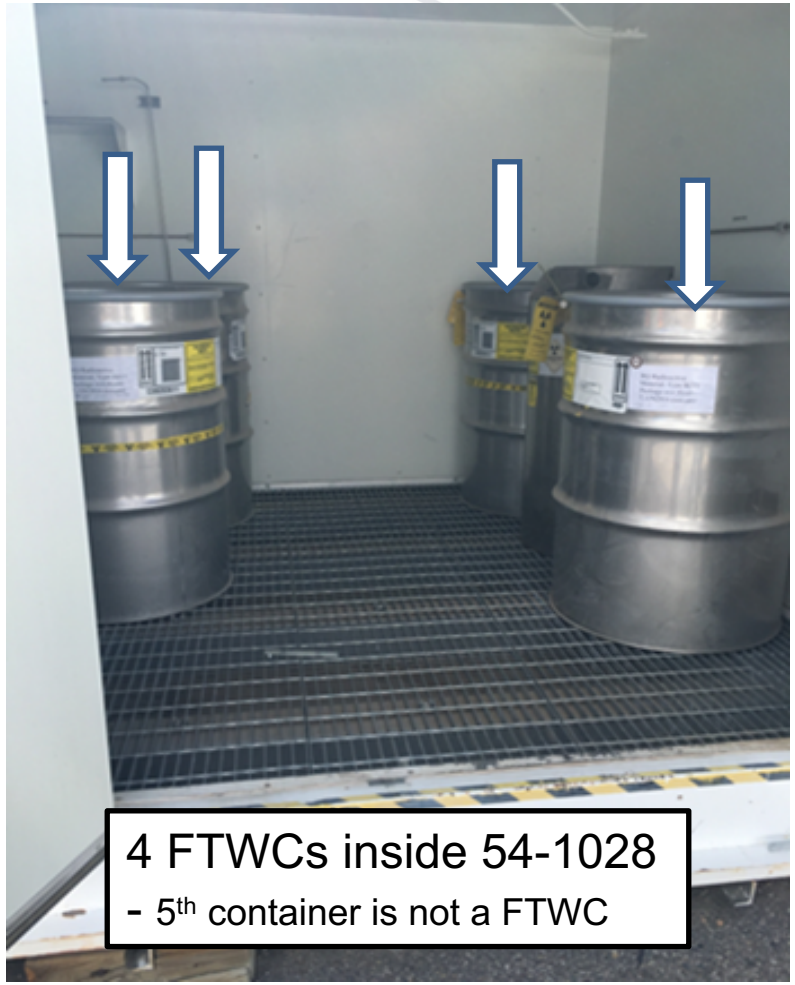
Area G FTWCs - Map

FTWC Storage Location
- TA-54-1028

Area G FTWCs



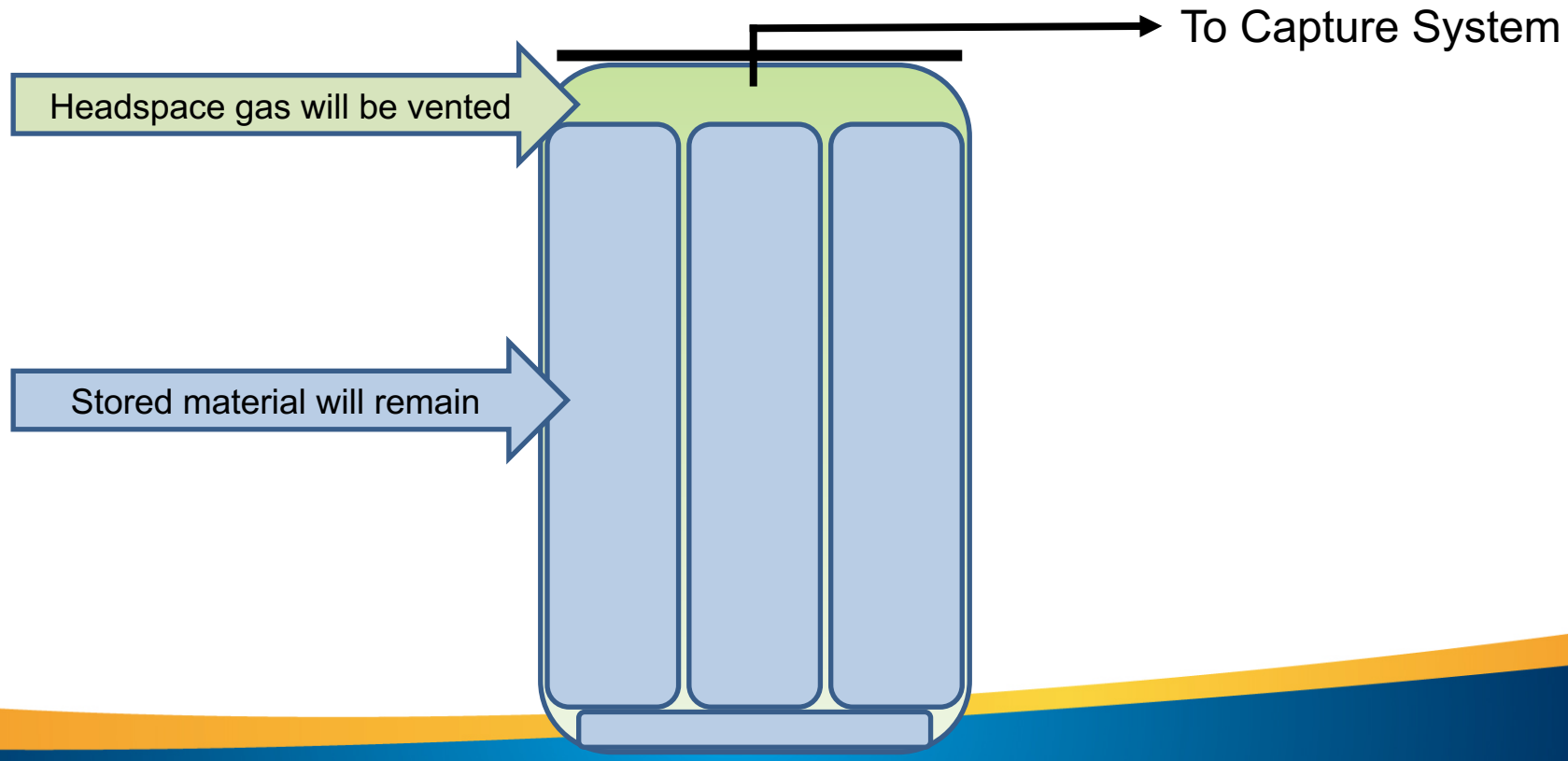
FTWC Storage Location
- TA-54-1028



4 FTWCs inside 54-1028
- 5th container is not a FTWC

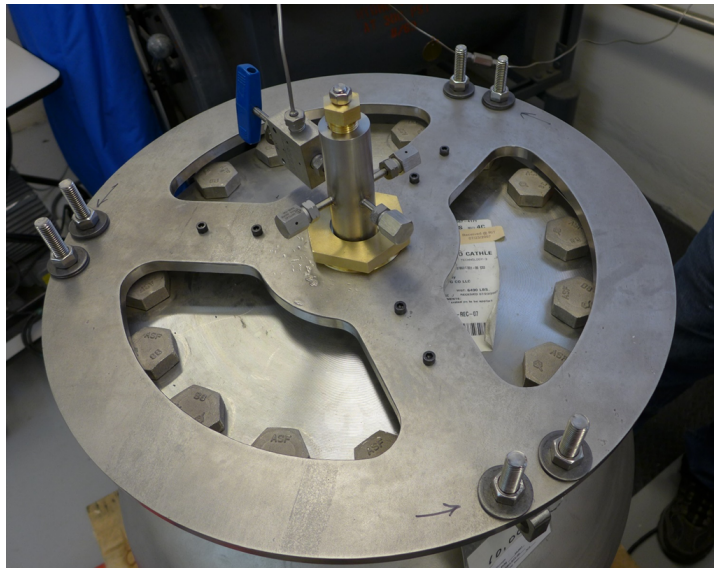
Area G FTWC Operational Plan

- To make the FTWCs safe for handling and transport, the pressure must be verified. They will be checked and vented one at a time, one per day, in a safe and compliant manner to remove any gases in the larger container (headspace). The tritium in the smaller containers will remain.
- Only the small volume of headspace gas, if present, will be vented:



Area G FTWC Operational Plan

- Any headspace gas will be routed through a capture system. Any gas not captured will be measured at the source. Existing plus supplemental site-wide air monitoring systems will also be used.
- The operation is designed so site and permit **limits cannot be exceeded**.

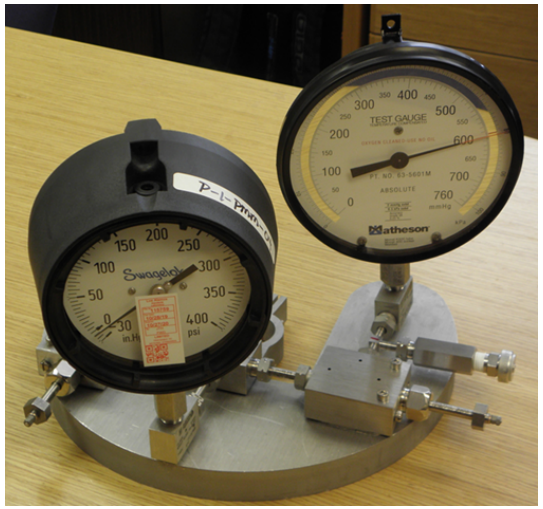


Venting Fixture

Capture System

Area G FTWC Plan

- Once verified safe for handling, a pressure monitoring manifold will be installed to ensure continuous safe configuration.
- The FTWCs will be transported to LANL's tritium facility and repackaged in compliant containers for permanent offsite disposal.
- This operation will require:
  - New Mexico Environment Department (NMED) Temporary Authorization
  - Environmental Protection Agency (EPA) Air Permit
  - Department of Energy (DOE) Readiness Reviews
  - Department of Transportation (DOT) Compliant Shipping



Pressure Monitoring Manifold

Area G FTWC Emissions Monitoring

- The administrative limit for this operation is 8 mrem.
  - The annual site emissions limit is 10 mrem to the maximally exposed individual (MEI).
    - Calculated at the nearest populated edge of LANL property closest to TA-54
    - Conservatively assumes 100% occupancy and exposure
    - Protecting the MEI will ensure all other residents in New Mexico are also protected
    - For context, we all receive ~400 mrem/yr living in NM from natural sources
- Worst-case, conservative wind modeling used for tritium emissions limits.
- Monitoring systems include:
  - Two real-time tritium monitors and a stack bubbler (EPA system of record) at the operation
  - Four bubblers installed in Airnet stations around Area G
  - All Airnet stations have tritium vapor collectors
- Sequence of operations is designed to ensure the site emissions limit cannot be exceeded.
- Stack emissions and dose calculations will be subtracted from the overall limit each day to determine the new limit for the next day's operations.

Summary

- The containers will be placed in a compliant and safe configuration in accordance with all state, federal, and local environmental and worker safety requirements.
- This operation will not proceed until all approvals are obtained.
- This project reduces onsite waste risk and waste inventory priorities.
- Multiple layers of controls will ensure that site air quality limits cannot be exceeded, and any emissions will be recorded and posted to the Electronic Public Reading Room (ePRR) and the Annual Site Environmental Report (ASER).

Questions/Answers

- Please explain the explosive potential of the FTWCs. What are the risks should an explosion occur? Why do the potential public health risks of venting outweigh the risks of not venting?

Questions/Answers

- The FTWCs have been in storage since 2008. What is the urgency in venting them now?

Questions/Answers

- What are the alternatives to open venting?

Questions/Answers

- Tritium has a half-life of 12.3 years. Why not just let the tritium decay away to reduce the public health risk?

Questions/Answers

- What tech are you using to capture the tritium? And what is the capture efficiency of this system? Why not just capture all of the tritium?

Questions/Answers

- The Lab asserts that the releases will be carefully monitored. Please explain?

Questions/Answers

- Are you placing these detectors at the point of outflow in such a way as to account for the entire source term?

Questions/Answers

- What environmental monitoring will you be conducting subsequent to the tritium releases?

Questions/Answers

- Will you be allowing offsite independent viewing of these releases as you record them in real-time?

Questions/Answers

- What are the destinations for the tritium shipments?

Questions/Answers

- We are downwind from the lab and very concerned about the release. What is the plan in case of a emergency related to the release?

Questions/Answers

- Why are the National Nuclear Security Administration, the United States Department of Energy, and the operators of the Los Alamos National Laboratory proposing this operation if there is a potential for health impacts?

Questions/Answers

- Why is there no non-generic environmental impact statement being prepared for this proposed project?

Questions/Answers

- Why not reduce the temperature of the containers to reduce the pressure?

Questions/Answers

- Tritium is rare and expensive to produce. What type of filtration system could be used to capture the tritium without the need to vent?

Questions/Answers

- What is the current volume of tritium in each container?

Questions/Answers

- The 40 CFR Subpart 61 annual radiological limit to the maximally exposed individual (MEI) is 10 mrem. How many Curies of tritium released into the environment would result in meeting or exceeding the 10-mrem limit for the MEI?

Questions/Answers

- We received a number of questions regarding reports, and specifically Defense Nuclear Facilities Safety Board (DNFSB) reports, about transuranic waste and plutonium.

Questions/Answers

- DOE/NNSA/LANL is asking NMED to issue a temporary authorization under the NMED Hazardous Waste Permit for LANL. Temporary authorizations are for operations taking a period of 180 days or less. The proposed venting activities have been on the books for years, if not decades.

Questions/Answers

- We note that the venting requirements are found in the N3B contract, but that Triad is requesting the temporary authorization to vent from NMED. Who is responsible for the proposed activities?

Questions/Answers

- There are more than the four Flanged Tritium Waste Containers in need of treatment. It appears that the proposed venting of four canisters is only the beginning of a campaign at LANL.

Questions/Answers

- How have you accounted for Organically Bound Tritium (OBT) in your derived dose factor? Have you accounted for chronic doses from OBT?

Questions/Answers

- Wouldn’t these exposures initially be short-term, not chronic? CAP88 v. 4 says it is for dose estimates of chronic, low-level exposure. Have you adjusted for that, and if so how?

Questions/Answers

- Are the derived dose factors for inhalation or ingestion or both?

Questions/Answers

- Are your release amounts protective of developing pregnancy since tritium can collect in fetal tissue at twice the amount of maternal tissue? What dose (re)construction/prediction formula are you using?

Questions/Answers

- What tests were conducted on releasing only "headspace" in each of the largest containers within which are smaller canisters? What safety concerns were noted?

Questions/Answers

- What research was performed and analysis made regarding the quantity of anticipated build-up of hydrogen and helium gases over time and the highest and best treatment plan for such build-up of radioactive gases?

Questions/Answers

- What potential quantity of release of radioactive tritium was scientifically estimated for potential release of radioactive tritium into the atmosphere?

Community Input

Members of the public may submit additional questions and comments to:

FTWC_publicinfo@lanl.gov

For more information, visit our website at:
www.lanl.gov/environment/ Select “Flanged Tritium Waste Containers”